

Claims

- [c1] 1.A high flow thermoplastic composition comprising:
(a)a host polymer; and
(b)a flow modifier polymer having a weight average molecular weight of less than about 15,000, the modifier polymer comprising at least one (meth)acrylate monomer and optionally at least one vinyl aromatic monomer, wherein the said composition is characterized by a relative energy difference (R.E.D.) between the flow modifier and the host polymer of less than 2.2.
- [c2] 2.The high flow thermoplastic composition of claim 1, wherein the weight average molecular weight of the flow modifier polymer is less than 10,000.
- [c3] 3.The high flow thermoplastic composition of claim 1, wherein the weight average molecular weight of the flow modifier polymer is less than 5,000.
- [c4] 4.The high flow thermoplastic composition of claim 1, wherein the host polymer is selected from the group consisting of polycarbonates, polycarbonate/acrylonitrile-butadiene-styrene blends, polyamides, polyesters, polyphenylene ethers, transparent-ABS resins, and com-

binations thereof.

- [c5] 5.The high flow thermoplastic composition of claim 1, wherein the host polymer is a polycarbonate.
- [c6] 6.The high flow thermoplastic composition of claim 1, wherein the host polymer is a polycarbonate/acrylonitrile-butadiene-styrene blend.
- [c7] 7.The high flow thermoplastic composition of claim 1, wherein the host polymer is selected from the group of polymers consisting of polyamide, poly(butylene terephthalate), poly(propylene terephthalate), poly(ethylene terephthalate), PETG, polyethylene naphthalate, polyphenylene oxide, and combinations thereof.
- [c8] 8.The high flow thermoplastic composition of claim 1, wherein the host polymer is present in an amount of from about 50 to about 99 weight percent and the flow modifier polymer is present in an amount of from about 1 to about 20 weight percent.
- [c9] 9.The high flow thermoplastic composition of claim 1, wherein the flow modifier polymer comprises (b1) 1–100 % of a (meth)acrylate monomer, (b2) 0–99% of at least one vinyl aromatic monomer, and (b3) 0–99% of another monomer or mix of monomers able to copolymerize with (b1) and (b2).

- [c10] 10.The high flow thermoplastic composition of claim 1, wherein the flow modifier polymer comprises from about 1 to about 70 weight percent of at least one (meth)acrylate monomer and from about 30 to about 99 weight percent of at least one vinyl aromatic monomer.
- [c11] 11.The high flow thermoplastic composition of claim 1, wherein the high flow thermoplastic composition has a melt flow index at least 5 percent higher than the host polymer.
- [c12] 12.The high flow thermoplastic composition of claim 1, wherein the notched Izod impact strength of the composition is no more than 40% less than the notched Izod impact strength of the host polymer.
- [c13] 13.The high flow thermoplastic composition of claim 1, wherein the heat deflection temperature of the composition is no more than 10°C less than the heat deflection temperature of the host polymer.
- [c14] 14.The high flow thermoplastic composition of claim 1, wherein the Vicat softening temperature of the composition is no more than 10°C less than the Vicat softening temperature of the host polymer.
- [c15] 15.The high flow thermoplastic composition of claim 1,

wherein the composition is a transparent composition having a haze percentage that differs by less than about 1 % from the haze percentage of the host polymer.

[c16] 16.The high flow thermoplastic composition of claim 1, further comprising at least one additive wherein the additive is a impact modifier, a mineral filler, a pigment, a dye, or a fire retardant.

[c17] 17.The high flow thermoplastic composition of claim 1, wherein the at least one vinyl aromatic monomer is styrene or a styrene derivative and the at least one (meth)acrylate monomer is selected from the group consisting of butyl methacrylate, methyl methacrylate, glycidyl methacrylate, butyl acrylate, 2-ethylhexyl acrylate, ethyl acrylate, acrylic acid and maleic anhydride.

[c18] 18.The high flow thermoplastic composition of claim 1, wherein the flow modifier polymer is substantially free of acrylonitrile monomer.

[c19] 19.A molded article made from the high flow thermoplastic composition of claim 1.

[c20] 20.The molded article of claim 19, wherein the article is an automobile part or a housing for a piece of electronic equipment.

[c21] 21. The molded article of claim 19, wherein the article is selected from the group consisting of a housing for a computer, a computer monitor, a keyboard, a printer, a fax machine, a telephone, a mobile communications device, such as a mobile phone, a camera, a power plug, an electrical switch, an electrical connector, an electrical control panel, a telecommunication connector, a telecommunication switch, an automobile control panel, an automobile indicator panel, a mount for a mirror, an automobile headlamp, an automotive bumper, automotive fascia, an automotive hood, an engine cover, a generator cover, a battery cover, an air manifold, automotive hoses and connectors, a tractor hood, an automotive panel, a tractor panel, a lawn mower deck, a lawn tool, a piece of office equipment, including a photocopier, a tray for a photocopier, household electronics, such as coffee makers, irons, vacuum cleaners, and fans, large appliances, such as televisions, DVD players, refrigerators, washing machines, and dryers; or parts for a computer, a computer monitor, a keyboard, a printer, a fax machine, a telephone, a mobile communications device, such as a mobile phone, a camera, a power plug, an electrical switch, an electrical connector, an electrical control panel, a telecommunication connector, a telecommunication switch, an automobile control panel, an automobile indicator panel, a mount for a mirror, an

automobile headlamp, an automotive bumper, automotive fascia, an automotive hood, an engine cover, a generator cover, a battery cover, an air manifold, automotive hoses and connectors, a tractor hood, an automotive panel, a tractor panel, a lawn mower deck, a lawn tool, a piece of office equipment, including a photocopier, a tray for a photocopier, household electronics, such as coffee makers, irons, vacuum cleaners, and fans, large appliances, such as televisions, DVD players, refrigerators, washing machines, and dryers.

- [c22] 22.A high flow thermoplastic composition comprising:
- (a) about 50 to about 99 weight percent of host polymer of a polycarbonate or a polycarbonate/acrylonitrile-butadiene-styrene blend; and
 - (b) about 1 to about 20 weight percent of a flow modifier polymer comprising at least one vinyl aromatic monomer and at least one (meth)acrylate monomer, the modifier polymer having a weight average molecular weight of less than 15,000, wherein the modifier polymer comprises from about 30 to about 99 weight percent of the at least one vinyl aromatic monomer and from about 1 to about 70 weight percent of the at least one (meth)acrylate monomer, wherein the said composition is characterized by a relative energy difference (R.E.D.) between the flow modifier polymer and the host polymer

of less than 2.2.

- [c23] 23.A molded article made from the high flow thermo-plastic composition of claim 22.
- [c24] 24.A method for increasing the flow of a host polymer comprising mixing with the host polymer and a flow modifier polymer having a weight average molecular weight of less than about 15,000, the flow modifier polymer comprising at least one vinyl aromatic monomer and at least one (meth)acrylate monomer wherein the said composition is characterized by a relative energy difference (R.E.D.) between the flow modifier polymer and the host polymer of less than 2.2.
- [c25] 25.The method of claim 24, wherein the host polymer is selected from the group consisting of polycarbonates, polycarbonate/acrylonitrile-butadiene-styrene blends, polyamides, polyesters, polyphenylene ethers, transparent ABS resins, and combinations thereof.
- [c26] 26.The method of claim 24, wherein the host polymer is a polycarbonate.
- [c27] 27.The method of claim 24, wherein the host polymer is a polycarbonate/acrylonitrile-butadiene-styrene blend.
- [c28] 28.A method for processing a high flow thermoplastic

composition comprising:

(a) mixing a host polymer and a flow modifier polymer having a weight average molecular weight of less than about 15,000, the flow modifier polymer comprising at least one vinyl aromatic monomer and at least one (meth)acrylate monomer to form a flow modified thermoplastic composition wherein the said composition is characterized by a relative energy difference (R.E.D.) between the flow modifier polymer and the host polymer of less than 2.2; and

(b) molding the flow modified thermoplastic composition, wherein the mixing and molding steps have a maximum processing temperature of about 350°C, and further wherein the flow modifier polymer undergoes a weight loss of less than about 10 % at the maximum processing temperature.

[c29] 29. The method of claim 28, wherein the maximum processing temperature is at least 180°C.

[c30] 30. The method of claim 29, wherein the maximum processing temperature is between 180°C and 350°C.

[c31] 31. A method for processing a high flow thermoplastic composition comprising: (a) mixing a host polymer and a flow modifier polymer having a weight average molecular weight of less than about 15,000, the flow modifier

polymer comprising at least one vinyl aromatic monomer and at least one (meth)acrylate monomer to form a flow modified thermoplastic composition wherein the said composition is characterized by a relative energy difference (R.E.D.) between the flow modifier polymer and the host polymer of less than 2.2; and (b)molding the flow modified thermoplastic composition, wherein the mixing and molding steps are carried out at shear rates in excess of $100,000 \text{ sec}^{-1}$ without the incidence of additive juicing or delamination.

[c32] 32.The method of claim 31, wherein a maximum shear rate in the mold is in excess of $300,000 \text{ sec}^{-1}$.

[c33] 33.The method of claim 30, wherein a maximum shear rate in the mold is in excess of $500,000 \text{ sec}^{-1}$.

[c34] 34.A high flow thermoplastic composition made according to the method of claim 24.

[c35] 35.A high flow thermoplastic composition made according to the method of claim 28.

[c36] 36.A high flow thermoplastic composition made according to the method of claim 31.